**IN THE SPECIFICATION:**

Please add paragraph [0016'] on page 3 following paragraph [0016].

[0016'] Fig. 8 illustrates an inkjet print head coupled to a Data Stream Processor and a print controller coupled to a Data Validating Module.

Please replace the original paragraph [0006] on page 2 with the following amended paragraph.

[0006] In yet another form, the invention provides a data error detection system on an inkjet print head coupled to a printer host. The data error detection system includes a print head communicator that couples the print head and the printer host, and communicates a first data stream between the print head and the printer host. The system further includes a data stream processor (as shown in Fig. 8) that is coupled to the print head, and inserts a reference data stream into the first data stream, and a data validating module (as shown in Fig. 8) coupled to the printer host, and validates the first data stream based on the reference data stream.

Please replace the original paragraph [0018] on page 4 with the following amended paragraph.

[0018] FIG. 1 illustrates an inkjet print head 10 according to one embodiment of the invention. The print head 10 includes a housing 12 that defines a nosepiece 13 and an ink reservoir 14 containing ink or a foam insert saturated with ink. The housing 12 can be constructed of a variety of materials including, without limitation, one or a combination of polymers, metals, ceramics, composites, and the like. The inkjet print head 10 illustrated in FIG. 1 has been inverted to illustrate a nozzle portion 15 of the print head 10. The nozzle portion 15 is located at least partially on a bottom surface 26 of the nosepiece 13 for transferring ink from the ink reservoir 14 onto a print medium (not shown). The nozzle portion 15 can include a heater chip [[16]] (not visible in FIG. 1) and a nozzle plate 20 having a plurality of nozzles 22 that define a nozzle arrangement and from which ink drops are ejected onto printing medium that is advanced through a printer (not shown). The nozzles 22 can have any cross-sectional shape desired including, without limitation, circular, elliptical, square, rectangular, and any other polygonal shape that allows ink to be transferred from the print head 10 to a printing medium. The heater chip [[16]] can be formed of a variety of materials including, without limitation, various forms of

doped or non-doped silicon, doped or non-doped germanium, or any other semiconducting material. The heater chip [[16]] is positioned to be in electrical communication with conductive traces 17 provided on an underside of a tape member 18.

Please replace the original paragraph [0019] on page 4 with the following amended paragraph.

[0019] The heater chip [[16]] is hidden from view in the assembled print head 10 illustrated in FIG. 1. The heater chip [[16]] is also attached to the nozzle plate 20 in a removed area or cutout portion 19 of the tape member 18. The heater chip [[16]] is attached such that an outwardly facing surface 21 of the nozzle plate 20 is generally flush with and parallel to an outer surface 29 of the tape member 18 for directing ink onto a printing medium via the plurality of nozzles 22 in fluid communication with the ink reservoir 14. Although thermal inkjet printing apparatus is used in the example, other types of inkjet technology such as piezoelectric technology can also be used with the invention.

Please replace the original paragraph [0022] on page 5 with the following amended paragraph.

[0022] As described earlier, heater chips are a primary electronic component of ink jet print heads. Heater chips include memory which can store information within digital memory cells in the chip [[16]]. This allows the print head to pass information stored on the heater chip to the print head host (the printing system to which it attaches) or the print controller 100 through the paths 104 controlled by the print controller 100.

Please replace the original paragraph [0024] on page 6 with the following amended paragraph.

[0024] In some heater chip designs, the heater chip [[16]] passes the stored information or data to the controller 100 as a digital data stream such as a sequence of high and low voltages, binary logic states, or bits transferred in time. The data passes from the heater chip (transmitter) [[16]] to the printer host (receiver) 100 via a single output channel named "ID." The printer host

100 clocks or synchronously sequences the data by providing a clocking control signal input channel named "LOAD" to the heater chip [[16]].

Please replace the original paragraph [0025] on page 6 with the following amended paragraph.

[0025] In some heater chip designs, it is not unusual to have data stream of a single binary logic state, that is, when the data is all high ("1") or all low ("0"). However, a data stream of a single binary state can also correspond to certain error conditions. Furthermore, if the heater chip [[16]] has lost the connection to the LOAD signal, the ID signal will remain in an inactive or low voltage state, and the printer host 100 may falsely interpret the data as all 0's. If the printer host 100 has lost the connection to the ID signal, the ID signal may float to an active state and the printer host 100 may falsely interpret the data as all 1's. That is, when a valid data stream of all 0's are passed, for example, the ID output channel during data transmission remains at a voltage level matching the inactive state of the ID output. In yet another example, when the data consists of all 1's, the ID output channel during data transmission remains at a voltage level that corresponds to an ID output open circuit condition. In this way, the printer host or the print controller 100 may consider the print head 10 to be malfunctioning due to the data received.

Please replace the original paragraph [0026] on page 6 with the following amended paragraph.

[0026] As shown in FIG 2, accordingly, addition of a plurality of bits or a reference data stream into the ID data stream 200 can be used to detect whether an error is present in the data during communication. For example, to help the printer or the printer host 100 to detect a framing error, a serial reference data stream can be inserted into the responses or data streams from the print head [[16]] 10. The additional reference data stream can be inserted into the data stream as any combination of start bits 204, sync bits 208, and stop bits 212 using a shift register, for example. Start bits 204 generally indicate a start of the data, sync bits 208 generally indicate a start or an end of a segment of the total data, and stop bits 212 generally indicate an end of the data. An absence of a start, sync or stop bit in a stream of data can indicate a "stuck at" condition which is a multiple bit link error.

Please replace the original paragraph [0028] on page 7 with the following amended paragraph.

[[0028]] To help the printer detect a link error, the print head [[16]] 10 can insert in the response any single bit error detection code, any multiple bit error detection code, any adjacent bit error detection code or any uni-directional bit error detection codes in the response stream of data. Examples of single-bit error detection codes are parity check codes and residue codes. Examples of a multiple bit, adjacent bit, and uni-directional bit error detection codes are "m" of "n" codes, duplication codes, cyclic codes such as cyclic redundancy checking ("CRC"), arithmetic codes including checksums, Berger codes, Hamming codes and horizontal or vertical parity codes. In addition, the printer can use the multiple bits, adjacent bit, and uni-directional bit error detection codes to correct errors.

Please replace the original paragraph [0029] on page 7 with the following amended paragraph.

[[0029]] Similar to the framing error detection, the use of start, sync, stop, and error correction codes in the serial data stream contained in print head memory and sent from the print head [[16]] 10 to print controller 100 will prevent the printer from misinterpreting the stored data. The stored data can be ink usage, print head identification, encryption keys, color table corrections or any other future use of data stored in print head memory. Furthermore, as shown in FIG. 2, the data stream is inserted also with an error correction code 216. Although the start bits, the sync bits, the stop bits, and the error correction codes are shown with lengths of two to four bits, other data lengths such as a single bit can also be used. Although the data stream shown in FIG. 2 has been described as a data stream sent from the print head 10 to the print controller 100, the same error detection technique can also be applied to data sent from the print controller 100 to the print head 10. Furthermore, the reference data stream can generally include any combination of start, data, sync, error correction/detection, and stop bits.